

# Ex. 5 Deliberative Process (DP)

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**From:** d'Almeida, Carolyn K.  
**Sent:** Wednesday, September 26, 2018 10:24 AM  
**To:** Davis, Eva <[Davis.Eva@epa.gov](mailto:Davis.Eva@epa.gov)>  
**Subject:** FW: 2018-9-25 - WAFB - ADEQ management wants ST012 remedial action initiated - EBR

FYI

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**From:** d'Almeida, Carolyn K.  
**Sent:** Wednesday, September 26, 2018 8:13 AM  
**To:** 'Wayne Miller' <[Miller.Wayne@azdeq.gov](mailto:Miller.Wayne@azdeq.gov)>  
**Cc:** Brian J. Stonebrink <[Stonebrink.Brian@azdeq.gov](mailto:Stonebrink.Brian@azdeq.gov)>; Herrera, Angeles <[Herrera.Angeles@epa.gov](mailto:Herrera.Angeles@epa.gov)>  
**Subject:** RE: 2018-9-25 - WAFB - ADEQ management wants ST012 remedial action initiated - EBR

Hi Wayne

We're not "trying to guess" where wells should go. That's not the issue delaying startup, and today's call is only for clarification of our request. AF is still in negotiation with their contractor about how these new wells will be paid for. I understand from Cathy that Dr. TerMaath has had to get involved in contract negotiations. It was AF's decision to delay injections until they have contract to put wells in place, we did not tell them to do that.

But the new information about microbial data is critical to cleanup. If there is not a population of benzene degraders present, the sulfate injections will not work. The purpose of sulfate injection is to stimulate a microbial population to degrade the BTEX. Benzene is the most recalcitrant to degrade, and that is our RAO. As we were discussing on Monday, it may be possible to bio-augment by adding a substrate culture, at least in some of the wells as a pilot test. This is what we plan to propose to AF at the October meeting. I understand there is a concern about sulfate loading rates as well. (Think of the impact of adding a ton of fertilizer to your garden in hopes of growing more vegetables and you end up burning your plants instead) Finding a balance between injection of microbial culture and injection of sulfate will be critical, thus bench scale tests are highly recommended at this point.

I appreciate your management's need to see progress. I do not know much about bioremediation, but a major concern is getting the right monitoring data to be able to have clear unambiguous results. Biodegradation is a slow process, takes place underground where it is difficult to observe, unlike SEE where the progress is rapid and obvious in terms of mass removed. My main concern at this point is just keeping the contaminants contained and out of downgradient water supply. I am afraid that sulfate injection could break apart and displace LNAPL, without a population of benzene degraders to attenuate it.

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*"Because a waste is a terrible thing to mind..."*

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**From:** Wayne Miller [<mailto:Miller.Wayne@azdeq.gov>]  
**Sent:** Tuesday, September 25, 2018 5:28 PM  
**To:** d'Almeida, Carolyn K. <[dAlmeida.Carolyn@epa.gov](mailto:dAlmeida.Carolyn@epa.gov)>  
**Cc:** steve <[steve@uxopro.com](mailto:steve@uxopro.com)>; Brian J. Stonebrink <[Stonebrink.Brian@azdeq.gov](mailto:Stonebrink.Brian@azdeq.gov)>  
**Subject:** 2018-9-25 - WAFB - ADEQ management wants ST012 remedial action initiated - EBR

Carolyn - A management meeting was held Tues., 9-25-2018. ADEQ management wants remediation. Now. No ad infinitum site studying.

Based on this meeting, I want you to know "My priorities":

- (1) Promote "field pilot" implementation. Waste Program Division Director Laura Malone and ADEQ's Chief Science Officer promote implementing the existing EBR plan as a "field study" (emphasizing the end-result caveat that if this remedy does not work, then another bio-amendment or remedy can be tried later). Implementation now.
- (2) Model the benzene plume. Have a knowledge content expert use the available data and present where benzene may be and may go. Stop trying "to guess" where to install wells. Modeling completed as soon as practicable.
- (3) Benzene characterization and containment/capture to be tackled independent to remedial "Pilot Study" field implementation.

(4) Try to find assurances for EPA. Emphasize that the Record of Decision is the clean-up contract, regardless Contractor's remedy.

Please be aware that I was directed **to change ADEQ's Contractor tone. ADEQ knowledge content experts are to support ADEQ's "giving it a go" attitude.**

I was informed that ADEQ (and UXO Pro, Inc.) may have to embrace more of the AMEC/Wood "good for EBR" info.

- Emphasize progress forward (even if partial remedy)
- De-emphasize benzene plume migration as reason to not move forward
- Emphasize benzene (and other) contaminant consuming biota re-colonizing
- Emphasize field testing the sulfate solution
- Emphasize field confirming mixing models
- Etc
- Etc

I understand this is contra to what Eleanor Jennings and all the knowledge experts have been leaning toward, but.....

I know this is not in pure synchronization to EPA, but...

Carolyn, Steve – Thanks for your understanding.

Please let me know if this will create insurmountable issues.

Wayne Miller  
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